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ABSTRACT

Comparison was made between the effectiveness of three relaxation training procedures: (1) Behavioral Relaxation Training, which consisted of training in relaxing specific parts of the body and controlling breathing; (2) Meditation (based on Benson's procedure for eliciting the relaxation response); and (3) Seashore Sounds "Attention Focusing," which had subjects simply attend to seashore sounds and was designed as a placebo treatment. Thirty-nine undergraduate college students participated. Training consisted of a pretest measurement, six training sessions, a post-training measurement, and a follow-up measure. The electromyographic activity of each subject's frontalis muscle was monitored by an Autogen 1700 myograph, and Skin Conductance Level was measured by the Autogen 3000 feedback dermograph. All physiological measures were collected by an Autogen 5400 Data Acquisition center. A self-report was administered, consisting of a single-page scale containing seven descriptors of tense and relaxed states. Results generally failed to support the hypothesis that the Behavioral Relaxation Training and/or Meditation groups would produce significantly greater reductions in stress than the Seashore Sounds "Attention Focusing" group. (JD)

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ED230555

"A COMPARATIVE EVALUATION OF THREE RELAXATION TRAINING PROCEDURES"

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Annual Alliance of HPERD National Convention in Minneapolis, MN

This research compared the effectiveness of three relaxation training procedures on reducing measures of tension from the behavioral (Behavioral Relaxation Scale), physiological (Electromyographic and Skin Conductance) and cognitive (Self-Report) response classes.

The main purposes of this investigation were: (a) To determine the overall effectiveness of three relaxation training procedures; (b) to determine which technique was the most effective in reducing dependent measures of tension representative of behavioral, physiological, and cognitive domains; and (c) to determine the extent of correlation between the dependent measures.

DEPENDENT MEASURES

The Behavioral Relaxation Scale consists of ten items scores as either relaxed or unrelaxed. The BRS items are: 1) Breathing, 2) Quiet, 3) Body, 4) Head, 5) Eyes, 6) Mouth, 7) Throat, 8) Shoulders, 9) Hands, and 10) Feet. The BRS has been validated through electromyographic studies conducted by Maurer & Poppen. Inter-rater reliability on the BRS for this study averaged 92%.

Electromyographic activity of each subjects' frontalis muscle was monitored by an Autogen 1700 myograph, Skin Conductance Level was measured by the Autogen 3000 feedback dermograph. All physiological measures were collected by an Autogen 5400 Data Acquisition Center.

Self-Report consisted of a single-page scale containing seven descriptors of tense and relaxed states.

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RELAXATION TRAINING CONDITIONS

The three relaxation training conditions evaluated in this study were:

1) Behavioral Relaxation Training (which consisted of training and modeling the ten items on the BRS along with verbal feedback given using a 2-minute time-sampling procedure).
2) Meditation (based on Benson's procedure for eliciting the relaxation response) and
3) Seashore Sounds "Attention Focusing" Placebo Control (which simply had subjects attend to seashore sounds).

The latter method was designed to serve as a placebo treatment to control for expectation and other nonspecific effects.

DESIGN AND STATISTICAL ANALYSIS

Thirty-nine undergraduate students attending Southern Illinois University at Carbondale and enrolled in Personal Health courses volunteered for the study. They were screened for prior relaxation training, blocked on sex, and randomly assigned to the treatment groups. The training occurred between February 15 and April 30, 1982. The general protocol for each training group consisted of a pretest measurement, six training sessions, a post-training measurement, and, four weeks later, a follow-up measurement. Training for each subject was completed in a week to ten days.

A two-way mixed design Analysis of Variance was performed on each dependent measure. The significance level was set at the .05 probability level. When significant group main effects were obtained, Tukey's test for comparison between group means was performed to detect significance within groups and between group differences.

HYPOTHESES

Any significant interaction effects were interpreted as supporting the research hypothesis that there would be significant group by session interaction for each of the dependent measures. Significant sessions effects were interpreted as supporting the hypothesis that each of the procedures would produce significant reductions on each of the dependent measures. Significant group main effects, along with Tukey's post hoc analysis for between group differences, were considered in answering the research hypothesis that Behavioral Relaxation Training and/or Meditation would produce significantly greater reductions on the dependent measures than Seashore Sounds "Attention Focusing."

RESULTS

BRS. Inspection of Table 1 reveals that there were significant interaction, group, and sessions main effects for the Behavioral Relaxation Scale dependent measure. The interaction shows that the effects of practice (sessions) were not the same for the different training groups. As Figure 1 shows, the Behavioral Relaxation Training group experienced a sizeable decrease in unrelaxed behaviors (B.R.S. Scores), especially in comparison with the mean performances for the other two groups. Tukey's comparisons confirmed that there were significant within group reductions in BRS scores for the Behavioral Relaxation Training group, and that this group retained these reductions four weeks later. There were no significant within group changes for the other two groups. Also, Tukey's test used for between group analysis confirmed the significantly lower BRS scores for the BRT group.

EMG. Table 1 shows a significant sessions effect for the Electromyographic dependent measure, but no significant interaction or group main effect. Thus, it appears that there was a general trend toward reduced EMG levels across

sessions for all three groups (see Figure 2), however, no significant group differences in training were revealed. One explanation could be habituation over time to the experimental setting.

SCL. Table 1 shows no interaction, group, or sessions main effects for Skin Conductance Level. Also, inspection of Figure 3 shows high variability between and within groups. Thus, none of the training groups was effective in reducing this measure of stress.

S-R. Table 1 reveals a significant sessions effect for Self-Report and, as Figure 4 shows, there was a general pattern of reduced Self-Report scores across sessions. However, lack of a group or interaction effect suggests that no group had reductions significantly greater than the other groups.

CORRELATION

A Pearson product-movement correlation matrix among the four dependent variables at posttest is presented in Table 2. As can be seen, there were no significant correlations between any of the dependent variables.

DISCUSSION

The results generally failed to support the hypothesized interaction effect. They do give some support to the hypothesis that each of the procedures would produce significant reductions on the dependent measures, in that there were significant sessions effect on the BRS, EMG, and Self-Report dependent measures. Thus, the training procedures appear to be at least somewhat effective in reducing these measures of tension.

The results generally failed to support the hypothesis that the Behavioral Relaxation Training and/or Meditation groups would produce significantly greater reductions on the dependent measures than the Seashore Sounds "Attention

Focusing" group. Only on the BRS measure was there a significant group effect indicating that the Behavioral Relaxation Training group had significant reductions in BRS scores while the other two groups did not. This however, should be expected, since the Behavioral Relaxation Training group was directly trained on the BRS items. The results suggest that Behavioral Relaxation Training was effective in establishing instructional control over the subjects in this group.

Finally, the lack of significant correlations between any of the dependent variables failed to support the research hypothesis that there would be significant correspondence between the dependent measures of tension.

IMPLICATIONS

1. The results suggest that almost any relaxation method the health educator chooses to teach or use, so long as it has the nonspecific elements recommended by Benson, could be effective in reducing at least some measures of tension.
2. The results support Benson's hypothesis that nonspecific elements of relaxation training may be all that is necessary to produce significant reductions on some measures of tension.
3. Yet, the lack of significant correlation between the dependent measures calls into question Benson's hypothesis of a generalized relaxation response.
4. Another implication is that the Seashore Sounds "Attention Focusing" procedure may not be a placebo control based on the findings from this investigation.

RELATED REFERENCES

Brandon, J.E. "Comparative evaluation of three relaxation training procedures." Unpublished doctoral dissertation, Southern Illinois University at Carbondale, 1982.

Poppen, R. and Maurer, J.P. "Electromyographic analysis of relaxed postures." Biofeedback and Self-Regulation, in press.

Schilling, D.J. and Poppen, R. "Behavioral relaxation training and assessment." Submitted to Behavior Therapy.

TABLE 1

TWO-WAY MIXED FACTOR ANALYSES OF VARIANCE
ON THE BRS, EMG, SCL, AND S-R DEPENDENT MEASURES

Dependent Measures	Source	df	Mean Square	F Value	Prob.
BRS	Group	2	5152.19	47.14	.0000
	Subject(Group) (error term)	30	109.29		
	Sessions	8	129.10	8.49	.0000
	Group X Session	16	125.17	8.24	.0000
	Subj(Grp)XSess (error term)	240	15.19		
EMG	Group	2	6.42	1.42	.2598
	Subject(Group) (error term)	25*	4.51		
	Sessions	8	1.37	2.73	.0070
	Group X Session	16	0.30	0.60	.8798
	Subj(Grp)XSess (error term)	200*	0.50		
SCL	Group	2	10.29	0.02	.9777
	Subject(Group) (error term)	24*	455.46		
	Sessions	8	65.94	1.47	.1715
	Group X Session	16	43.68	0.97	.4890
	Subj(Grp)XSess (error term)	192*	44.94		
S-R	Group	2	4.61	0.83	.4451
	Subject(Group) (error term)	30	5.55		
	Sessions	8	4.06	5.78	.0000
	Group X Session	16	0.97	1.38	.1513
	Subj(Grp)XSess	240	0.70		

*Differences in degrees of freedom for error terms reflect missing data on the EMG and SCL measures due to equipment malfunctions.

TABLE 2

CORRELATION MATRIX FOR EACH DEPENDENT VARIABLE AT POSTTEST

	BRS	EMG	SCL	S-R
BRS		-0.1070 (0.5532)*	0.1659 (0.3560)	0.1139 (0.5280)
EMG			0.1703 (0.3432)	-0.1118 (0.9508)
SCL				0.3350 (0.0567)
S-R				

*Significance Level

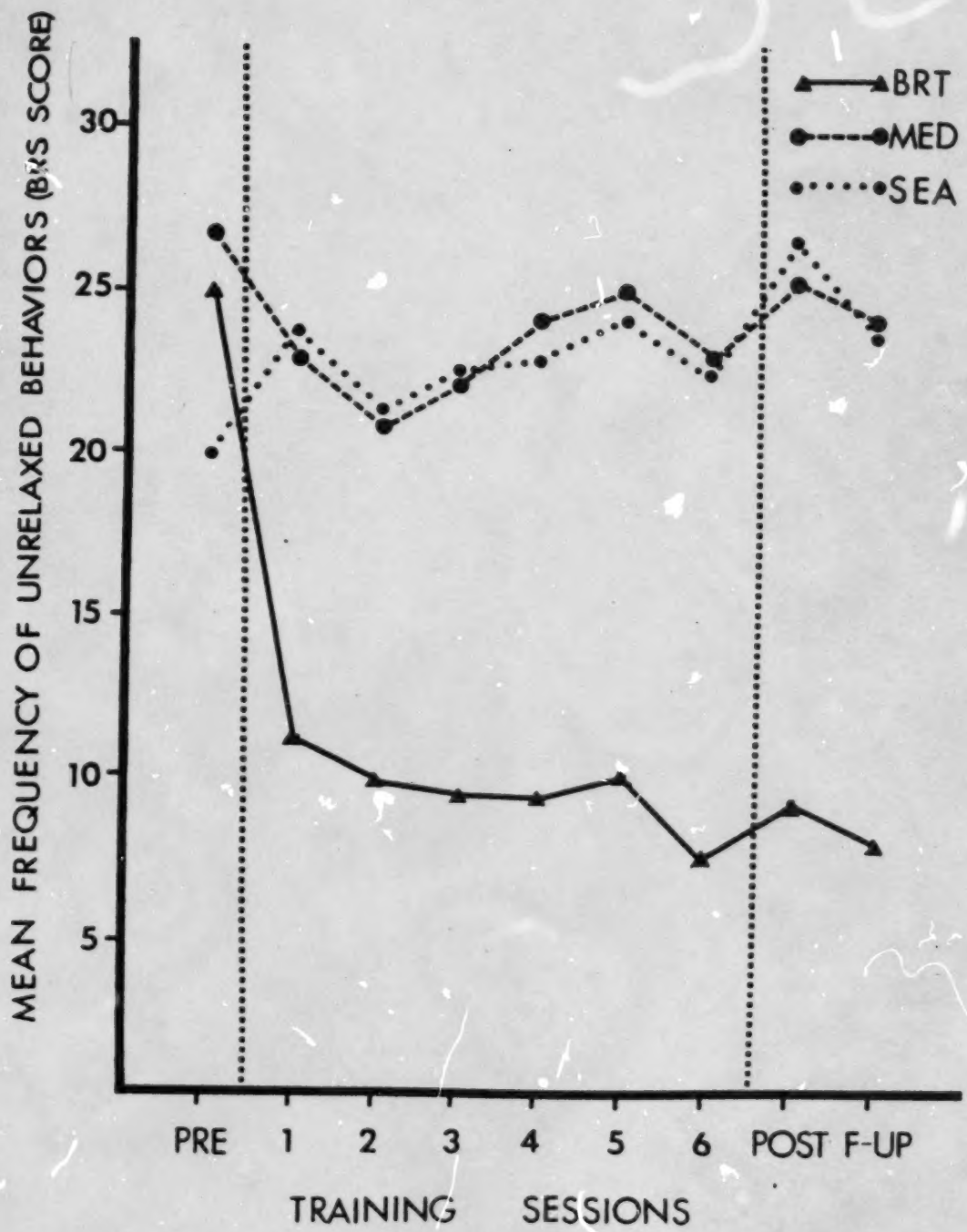
MEAN FREQUENCY OF UNRELAXED BEHAVIORS (BRS SCORE)
30
25
20
15
10
5
BRT
MED
SEA
PRE
1
2
3
4
5
6
POST
F-UP
TRAINING SESSIONS

FIGURE 1

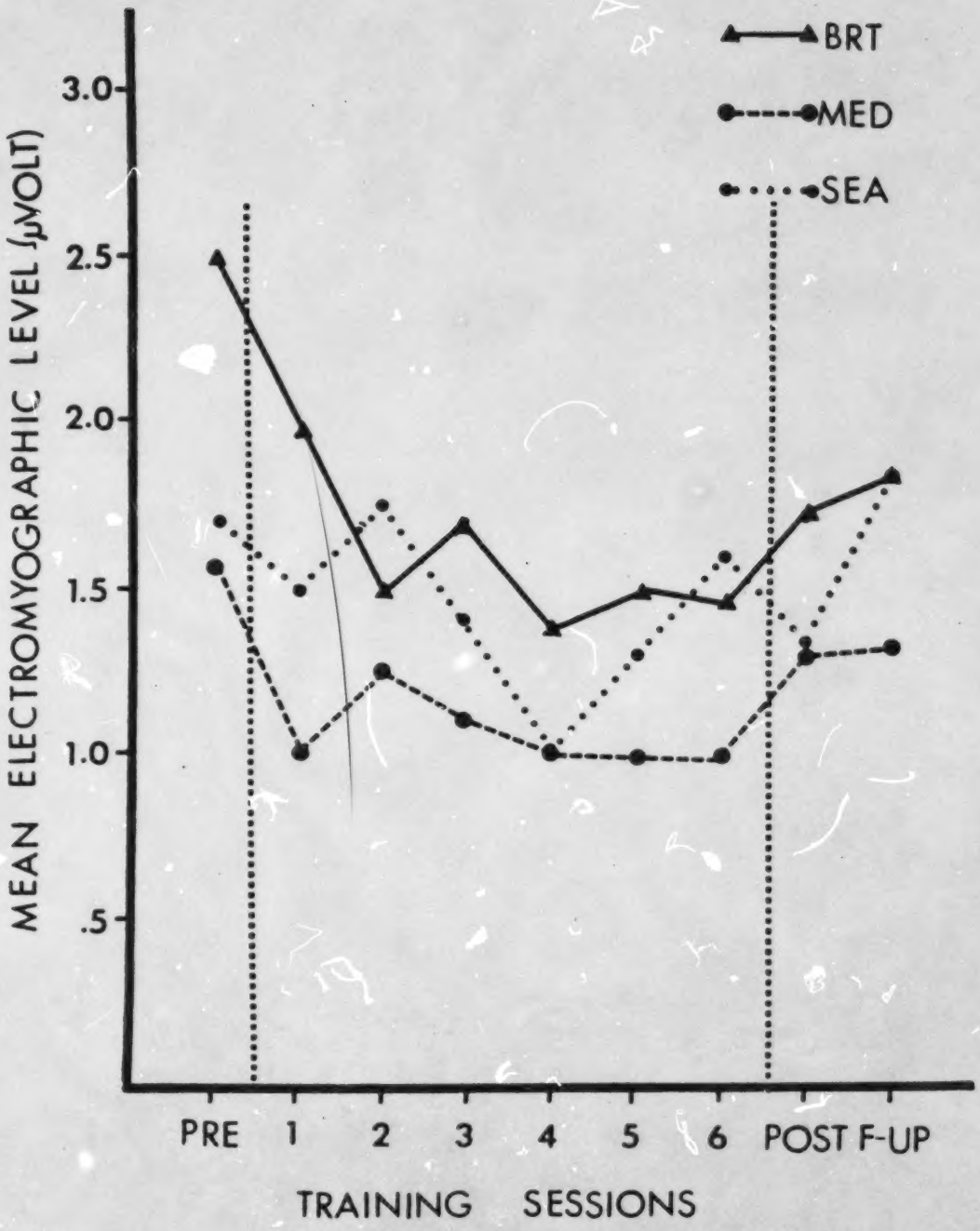
BRT
MED
SEA
MEAN ELECTROMYOGRAPHIC LEVEL (μVOLT)
3.0
2.5
2.0
1.5
1.0
.5
PRE
1
2
3
4
5
6
POST F-UP
TRAINING SESSIONS

FIGURE 2

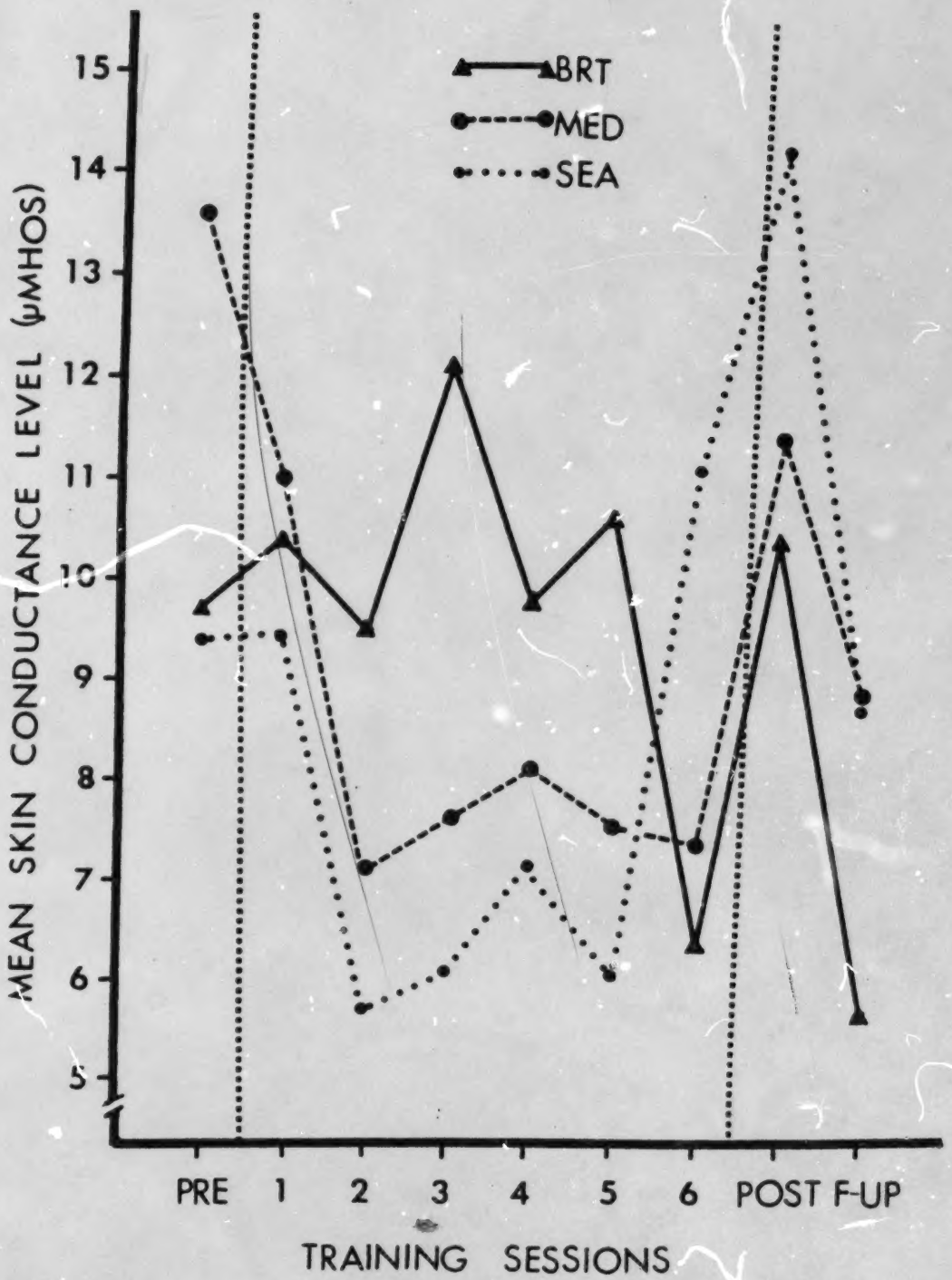
BRT
MED
SEA
MEAN SKIN CONDUCTANCE LEVEL (μMHOS)
15
14
13
12
11
10
9
8
7
6
5
PRE
1
2
3
4
5
6
POST
F-UP
TRAINING SESSIONS

FIGURE 3

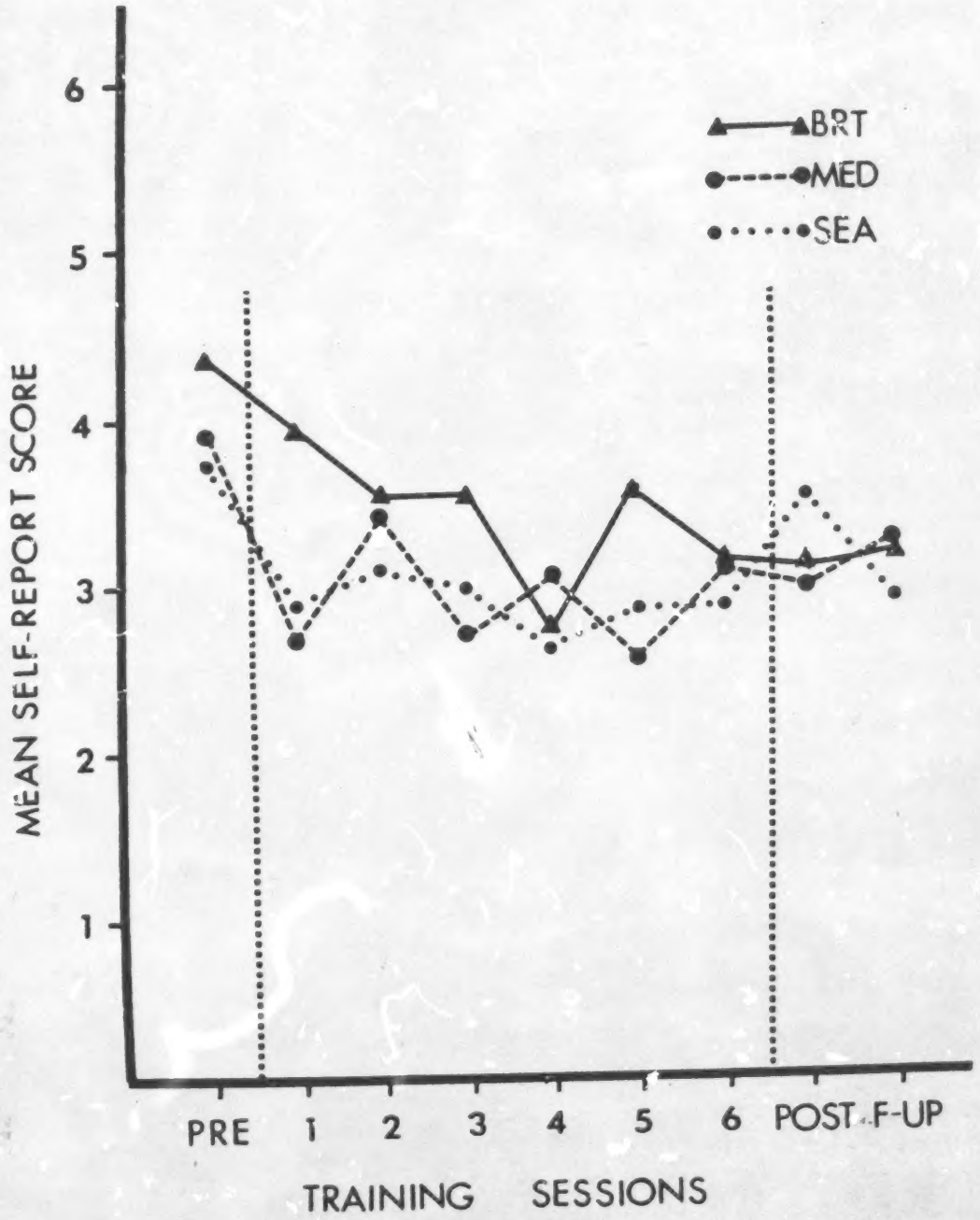
BRT
MED
SEA
MEAN SELF-REPORT SCORE
6
5
4
3
2
1
PRE
1
2
3
4
5
6
POST
F-UP
TRAINING SESSIONS

FIGURE 4